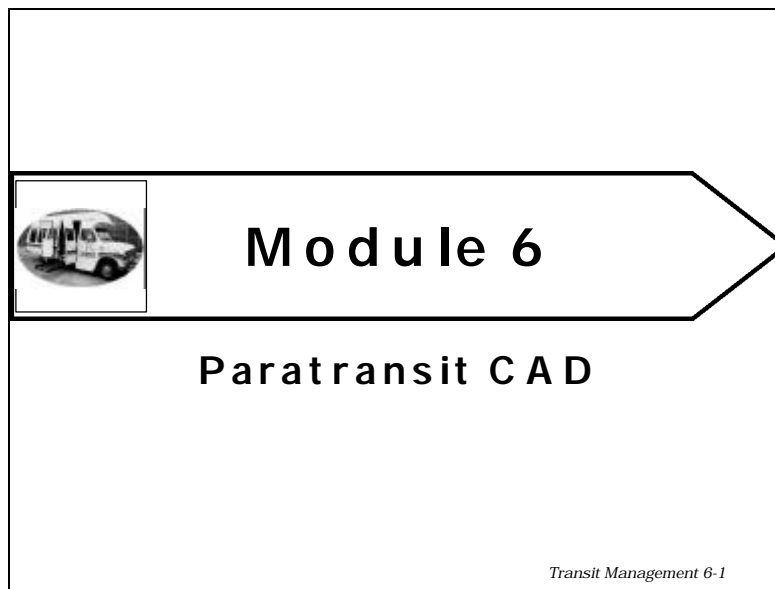


Module 6: Paratransit Computer-Aided Dispatch (CAD)



TRANSIT MANAGEMENT TRAINING ROADMAP	
	Module 1: Introduction to ITS and APTS
	Module 2: Automatic Vehicle Location Systems
	Module 3: Automated Transit Information
	Module 4: Transit Telecommunications
	Module 5: Transit Operations Software
Module 6: Paratransit Computer-Aided Dispatch	
	Module 7: Electronic Fare Payment
	Module 8: Technologies for Small Urban and Rural Transit Systems
	Module 9: Stages of ITS Project Deployment
	Module 10: What Can ITS Do for Me?

Where is Paratransit CAD?:

- Scheduling
- Dispatching

Technologies:

- Scheduling and dispatching software
- Transit telecommunications
- Mapping software
- AVL linkage
- On-board mobile data terminals



Module 6: Paratransit CAD

Introduction

Slide: Goal

Goal

- To provide an overview of advanced technologies applied to paratransit computer aided dispatch (CAD) systems

Transit Management 6-2

**Module
objective**

Given a table listing Paratransit CAD technologies and a success story, students will be able to describe possible benefits of using ITS technologies in their own paratransit applications.

Continued on next page



Introduction, Continued

Slide:
Module Outline

Module Outline

- What is paratransit?
- Paratransit technology integration
- Advantages and disadvantages
- Example
- Custom course notes

6-3



What is Paratransit?

Slide:
What Is
Paratransit?

What Is Paratransit?

- Definition
- Scheduling
- Dispatching



Transit Management 6-4

**Definition:
Paratransit**

Paratransit is a public transportation service that is more flexible and personalized than conventional fixed route, fixed schedule service. It can be available to the general public and/or to certain groups, such as the elderly. The ADA requires that public entities operating fixed route transportation for the general public also provide complementary paratransit service to persons unable to use the fixed route system.

The ADA specify:

- when this service is required
- eligibility criteria for these paratransit services
- the level of service which must be provided
- standards for certain aspects of operation

According to the Code of Federal Regulations (CFR) Title 49, Part 37, the regulatory component of the ADA: “Each public entity operating a fixed route system shall provide paratransit or other special services to individuals with disabilities that is comparable to the level of service provided to individuals without disabilities who use the fixed route system” (49CFR37.121(a)).

Continued on next page



What is Paratransit?, Continued

Table of Paratransit Terms	
Term	Definition
Paratransit	Paratransit is a public transportation service that is more flexible and personalized than conventional fixed route, fixed schedule service. It can be available to the general public and/or to certain groups, such as the elderly.
Americans with Disabilities Act of 1990 (ADA)	A civil rights law passed by Congress in 1990 that makes it illegal to discriminate against people with disabilities in employment, services provided by state and local governments, public and private transportation, public accommodations, and telecommunications.
Demand Response	Service characterized by flexible routing and scheduling of relatively small vehicles to provide door-to-door, curb-to-curb, or point-to-point transportation.
Fixed Route	Service provided on a repetitive, fixed-schedule basis along a specific route with vehicles stopping to pick up and deliver passengers to specific locations; each fixed-route trip serves the same origins and destinations, unlike demand responsive and taxicabs.

Scheduling

Paratransit systems can use advanced scheduling technologies to set up:

- advanced trip reservations
- standing orders/subscriptions
- immediate requests when integrated with real-time dispatching

Dispatching

Computer-aided dispatching software can be used to assign customers to demand responsive vehicles that are operating in shared ride mode.



Paratransit Technology Integration

Slide:
Paratransit
Technology
Integration

Paratransit Technology Integration

- Scheduling & dispatching software
- Advanced telecommunications
- Mapping software
- AVL linkage
- On-board mobile data terminals

Transit Management 6-5

Scheduling and dispatching software

Scheduling and dispatching software aids in the development of routes, assigning passengers, and creating schedules. These software systems will help paratransit operators become more efficient by grouping and locating rides. The software can also be easily combined with the other ITS technologies listed here.

Transit telecommu- nications

Communications between dispatch and mobile data terminals (MDT) on vehicles use:

- radio frequency (RF) telecommunications
 - ◊ transmissions using radio signals
- cellular digital packet data (CDPD) technology
 - ◊ communication which detects idle air time over existing cellular phone channels and sends data “packets” during this time
 - ◊ charged per “packet,” not for idle time

Continued on next page



Paratransit Technology Integration, Continued

Geographic Information Systems (GIS)

Geographic Information Systems (GIS) are a combination of electronic maps and relational databases. Users can cross-reference transit information from a database with various maps (fixed bus route, street maps, etc.). GIS mapping software helps determine an individual's location and destination and whether both are within the paratransit zone. Paratransit zones for ADA eligible passengers are (at minimum):

- corridors with a width of 3/4 mile on each side of a fixed route
 - plus 3/4 mile radius at the ends of each fixed route
 - any small areas surrounded by these corridors
-

AVL linkage

AVL systems can be used in paratransit for many different applications:

- real-time ride scheduling
 - assisting operator with directions
 - providing customers with vehicle status
 - aiding in emergencies
 - generating travel time statistics
-

On-board terminals

Mobile data terminals (MDT) on board vehicles communicate with dispatch to transmit locations and receive instructions such as:

- directions to pick-ups and drop-offs
 - cancellations or additions
 - trip status
 - number of passengers and fares paid
 - can be configured to use electronic fare payment systems
-

Continued on next page



Paratransit Technology Integration, Continued

**Example:
Community
Transit**

Community Transit of Delaware County (Pennsylvania) is a private non-profit demand-responsive service that provides over 1,500 trips per day in the Philadelphia suburban area. Community Transit customers are persons with a transportation disadvantage, including the elderly, persons with disabilities, low-income, medically needy, and children.

Community Transit is in the process of deploying four integrated APTS technologies: automated scheduling and dispatching software, automated identification cards, mobile data terminals and radio frequency (RF) communications.

MDTs:

- provide the information link between the driver and passenger as opposed to between Community Transit and the passenger
- put the detailed data regarding the passenger's special needs into the hands of the Community Transit driver who needs it most.
- support the rapid and efficient transmission of the critical information on each passenger trip through data communication
 - ◊ could not be accomplished with the same quality and efficiency if it was done by voice
 - ◊ ensures the confidentiality of the information being transmitted between the dispatcher and driver
 - ◊ avoids compromising confidentiality which results from using voice communication to transmit important information regarding a passenger
- provide Community Transit dispatchers with direct access to drivers, especially in the event of a schedule or route change
 - ◊ Immediate communication is essential for utilizing the "dynamic" dispatch aspect of the automated scheduling and dispatching software.
 - ◊ Drivers are able to immediately communicate with dispatchers regarding events such as no-shows, vehicle problems, etc.

Continued on next page



Paratransit Technology Integration, Continued

Slide:
Technology
Integration

Technology Integration

- How much automation?



Transit Management 6-6


Continued on next page



Paratransit Technology Integration, Continued

How much automation?

Paratransit operators can use ITS technologies in many combinations for scheduling and dispatch. They can use technologies and manual systems, or have full automation.

Automation Levels	Systems
None	Phone operator reservation system with paper records Manual dispatch
Lowest  Highest	Computer-aided scheduling Manual dispatch with manual changes to the schedule
	Computer-aided scheduling Dynamic software changes to schedules and routes in real-time Manual dispatch
	Software that automatically communicates changes in schedules and routes in real-time to drivers via on-board displays
	AVL systems to assist in the decision-making process of the software

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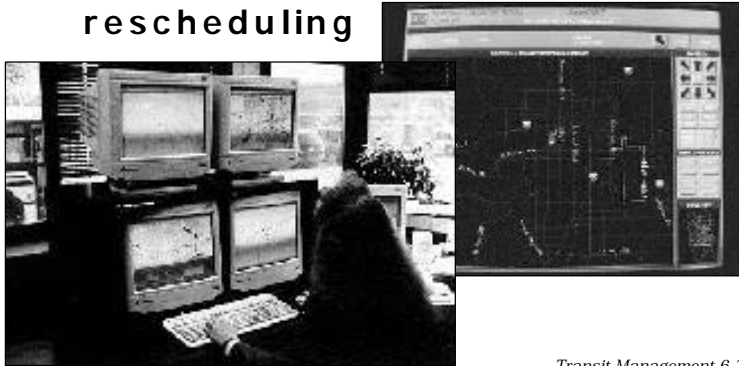


Paratransit Technology Integration, Continued

Slide: State-of-the-Art Scheduling

State-of-the-Art Scheduling

- Technology allows dynamic rescheduling



Transit Management 6-7

Scheduling software

Computerized scheduling software can automate and improve many paratransit scheduling tasks to:

- develop vehicle routes
- schedule vehicles and assign drivers
- generate driver rosters
- generate timetables
- match clients to available vehicles
- maximize vehicle usage
- view all trips for a client
- create multiple scheduling scenarios and solutions
- modify trip lengths based on traffic, weather, and location
- cross-check trips against holidays
- schedule trips within one hour of the requested pick-up time
 - ◊ required under 49CFR37 for ADA eligible passengers
- improve productivity (passengers per hour)

Continued on next page



Paratransit Technology Integration, Continued

Slide: State-of-the-Art Real-Time Dispatching

State-of-the-Art Real-Time Dispatching

- **Dynamic re-routing based on changes in schedules**
 - radio frequency communications
 - on-board mobile data terminals
 - AVL



Transit Management 6-8

Dynamic re-routing

Using radio frequency communications, on-board mobile data terminals (MDT), and AVL technology, paratransit operators can dynamically re-route their vehicles according to real-time schedules. Real-time re-routing allows the dispatcher to:

- check en-route vehicle status
- re-assign trips and redistribute rides from one vehicle to another if there are service interruptions or changes
- gather information in case of incidents
- adjust schedules in the event of last minute cancellations
- remain in the timeframe and service delivery requirements of the ADA

How it works

When dispatch needs to re-route a bus, a message is sent using radio communications to the on-board MDT. The driver receives the change on-board on the MDT and makes the change in routing.

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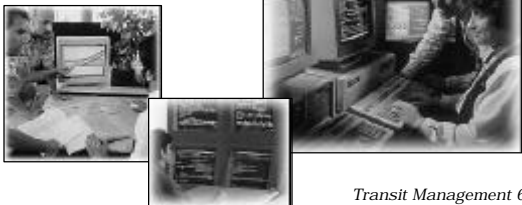


Paratransit Technology Integration, Continued

Slide: State-of-the-Art GIS

State-of-the-Art GIS

- Combination of an electronic map and a relational database
- Operations planning
- AVL operations



Transit Management 6-9

Electronic map and relational database

GIS users can cross-reference transit information from a database with various maps (fixed bus route, street maps, etc.). Paratransit applications can take advantage of the features of GIS.

Continued on next page



Paratransit Technology Integration, Continued

GIS and Paratransit

Paratransit operators use GIS to plan their operations and solve complex problems. Operators can:

- calibrate distances
 - determine the geographic eligibility of the client within service area or based on needs, e.g.:
 - ◊ If a client cannot reach a fixed route stop, the traveler would be picked up by paratransit.
 - ◊ If it is a “high peak” time and the client cannot maneuver in crowded situations, the client would be picked up by paratransit.
 - ◊ If the client is in close proximity to the fixed route, the client should use the regular fixed route service.
 - find landmarks and directions to assist drivers
 - decide if geographic features and road types (bridges, mountains, one-way streets, etc.) will impact scheduling
-

AVL operations

With AVL and GIS, paratransit operators can do such things as:

- re-route vehicles based on traffic conditions
 - find exact vehicle locations on a map and determine the distance to pick-ups and drop-offs
 - determine nearest vehicle to request and dispatch in real time
 - contact or respond to passengers regarding real-time status of paratransit vehicle
-

Continued on next page



Paratransit Technology Integration, Continued

**Example:
ACCESS**

State of the art technologies can facilitate fixed-route/paratransit coordination. GIS technology can be used to develop information about the accessibility of services and the accessibility of paths-of-travel. ACCESS, a brokerage in Pittsburgh, PA, provides paratransit feeder service and uses a GIS tool to improve customer information systems services and facilitate trip eligibility by:

- gathering and storing path of travel as well as fixed route service information:
 - ◊ curb cuts
 - ◊ intersection accessibility
 - ◊ description of every single intersection
 - ◊ sidewalk condition
 - ◊ terrain
 - ◊ fixed route stop location
 - ◊ stop amenities (shelters, benches, phones)
- determining exact walking distances and alternative paths of travel
- determining trip eligibility
- providing customers with “trip tips” which include detailed information about using fixed route service

Such detail in a GIS database tool naturally has a number of maintenance issues.

Web site: <http://Trfn.clpgh.org/trcil/access-to-pgh-guide/transportation.html>



Advantages and Disadvantages

Slide:
Advantages

Advantages

- Improved scheduling and dispatching
- Increased productivity
- Information can be integrated into other agency functions

Transit Management 6-10

Scheduling and dispatching improved

All of the paratransit CAD systems help to improve scheduling and dispatching for demand-responsive fleets. Paratransit operators can use real-time scheduling and dispatching to save money and improve service.

Increased productivity

The use of computer-aided scheduling and dispatching will increase the productivity of paratransit systems by:

- improving schedule adherence
- monitoring the fleet for maximum deployment and efficient pick-ups and drop-offs
- dynamically scheduling around cancellations or no-shows
- maximizing vehicle capacity through improved scheduling
- streamlining routes with the help of GIS and AVL
 - ◇ can target trip distance or trip time or maximize both

Continued on next page



Advantages and Disadvantages, Continued

Widespread use of systems	There are many vendors selling automated scheduling and dispatching software, and many paratransit systems are using the new technologies.
Integration with other agency functions	<p>Paratransit scheduling and dispatching software can be integrated into other agency functions such as:</p> <ul style="list-style-type: none">• fixed route transit systems<ul style="list-style-type: none">◊ determining if some paratransit customers can be moved to fixed routes◊ knowledge of which areas demand more paratransit service and increasing accessibility of fixed route services and facilities for these areas◊ travel training programs, e.g., Red Cross sponsored program• operational reports and statistics• ADA compliance assurance• customer satisfaction tracking• other health & human services agencies
Management information	<p>Management personnel can use reports from the scheduling and dispatching software to:</p> <ul style="list-style-type: none">• monitor schedule adherence• generate rosters and driver records• create vehicle manifests
Billing and accounting functions	On-board mobile data terminals and scheduling software assist in billing and accounting functions by capturing fare information for billing purposes, such as the number of Medicaid eligible riders, or deductions in personal traveler accounts.

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Advantages and Disadvantages, Continued

ADA compliance

With scheduling software, on-board mobile data terminals, and GIS, paratransit operators can ensure their system's ADA compliance and check passenger and trip eligibility.

With scheduling software, paratransit operators can track:

- if an ADA eligible individual has a pattern of missing scheduled trips
- if ADA eligible visitors use the paratransit system more than twenty-one days in a year

When people apply for ADA Paratransit Eligibility, they can be issued identification cards that interact with the on-board mobile data terminals to:

- verify the passenger's paratransit access privileges
 - verify any personal care attendant's paratransit access privileges
 - record trip length and duration for billing purposes to the passenger's sponsoring agency
-

Other benefits

Benefits to passenger:

- speed
- availability
- information about status

Benefits to agency:

- maximize the fleet usage
 - possibly more time for maintenance
-

Continued on next page



Advantages and Disadvantages, Continued

Slide:
Disadvantages

Disadvantages

- Up-front software costs
- Implementation may not be easy
 - Integration
- Need to evaluate
 - hardware and software before installation
 - experience of paratransit operators who are using these systems

Transit Management 6-11

Implementation may not be easy

Although there are many paratransit CAD technologies available, not all of them have been successfully implemented.

Integration, while possible, is a serious issue.

- If your agency is sharing information with other agencies, you may face institutional barriers:
 - ◊ Do your organizations agree on terms? For example, what counts as a ride? If I take a paratransit feeder to take the main transit route, does that count as one ride or two? This can make a difference in your statistical evaluation of your system.
 - ◊ How does a brokered service fit in to your data collection?

Evaluate hardware and software

Paratransit operators need to evaluate all the available hardware and software before implementing any of it.

Continued on next page



Advantages and Disadvantages, Continued

Evaluate others' experiences

To assist in choosing paratransit CAD technologies, paratransit operators should evaluate the experiences of other operators who have similar systems and needs and use that particular technology.

- By using others' experiences, you can narrow down the list of system comparisons and not “reinvent” what others have already done.
-

Other costs

Other costs and staffing issues:

- CAD needs training
 - space
 - staffing
 - initial costs and confusion - may require more standardized operating procedures
 - conversion period from the former system to the new CAD system
 - links and compatibility issues can cost time and money when attempting to interface with other systems or networks, especially if a paratransit broker is involved
-




Examples

Slide: Examples

Examples

- W S T A Trans-AID



- Santa Clara OUTREACH

Transit Management 6-12

Continued on next page



Examples, Continued

**Example:
Winston Salem
Transit
Authority**

The Winston-Salem Transit Authority (WSTA) in North Carolina operates 22 paratransit vehicles, as well as 54 fixed-route buses and 75 vanpools with an average daily ridership of 9000, plus paratransit ridership. The paratransit service is called Trans-AID.

WSTA completed Phase I of a Mobility Manager program in December of 1995. They implemented computer-aided dispatch and scheduling for their entire paratransit fleet, and installed Mobile Data Terminals (MDTs) and AVL on three of their paratransit fleet.

The results of this trial of their AVL paratransit CAD system have:

- decreased operating expense by 8.5% per vehicle mile and by 2.4% per passenger trip
- increased customer satisfaction by 17.5%
- enabled client base to increase by 100%
 - ◊ This was an indirect result of being able to service more customers since client base is an ADA eligibility issue, not necessarily technology related.
- decreased passenger waiting time by 50%
- AVL greatly assisted the dispatchers
- MDT allowed the employee hours to be reconciled easily with the driver manifests (the drivers did not have to manually write their manifests anymore).

WSTA began Phase II in 1998, and will upgrade the entire paratransit fleet with MDT/AVL, as well as their transit fleet. They plan to tie the information collected to a real-time paratransit and transit automated information system.

Continued on next page



Examples, Continued

**Example:
Santa Clara**

Santa Clara County, CA has a paratransit operator called OUTREACH, which serves 7,500 clients every year. They successfully use three new technologies:

- a digital geographic database
- scheduling and dispatching software
- an AVL system

OUTREACH is able to offer the following services to its clients:

- toll-free scheduling phone line with a bilingual help staff
- unlimited rides for unlimited distances within the service area
- records of “no-show” (three “no-shows” per quarter are allowed)
- Open Return service
- requests up to fourteen days in advance
- subscription service
 - ◊ an automatic service for scheduling commonly occurring trips
- ID cards
- a second vehicle dispatched if the client misses a ride and is stranded

Phase III has recently begun in which a paratransit interface with fixed route transit is now possible for eligible clients. OUTREACH has been able to increase shared rides from 38% to 55% and thus decrease its fleet size from 200 to 130 vehicles.

Continued on next page



Examples, Continued

Example: Pierce Transit

The Pierce County Transportation Benefit Area Authority (Pierce Transit) mission is to provide safe, courteous, reliable transportation services over a 275 square mile area with an estimated population of 600,000 in western Washington state.

Pierce Transit provides fixed route, demand response, vanpool, computerized ridematching for cars and vans, and intercounty express service to Seattle and Olympia. It includes:

- 56 routes that operate over approximately 900 miles of city streets, county routes, and state highways from Seattle through Tacoma and on to Olympia
- a fleet of 190 buses, most of which are wheelchair accessible, many of which run on compressed natural gas
- over 175 covered bus shelters and 20 park and ride lots
- The demand response service, called SHUTTLE, provides transportation for people with disabilities. To best serve disabled riders and maximize SHUTTLE efficiency, rides are organized on a subscription, group, or call-in basis. Over 500,000 trips were provided in 1995, with nearly 70% of these trips provided by a private contractor.

Pierce Transit's fixed route service traveled over 7 million miles during 1995 and carried over 10 million passengers.

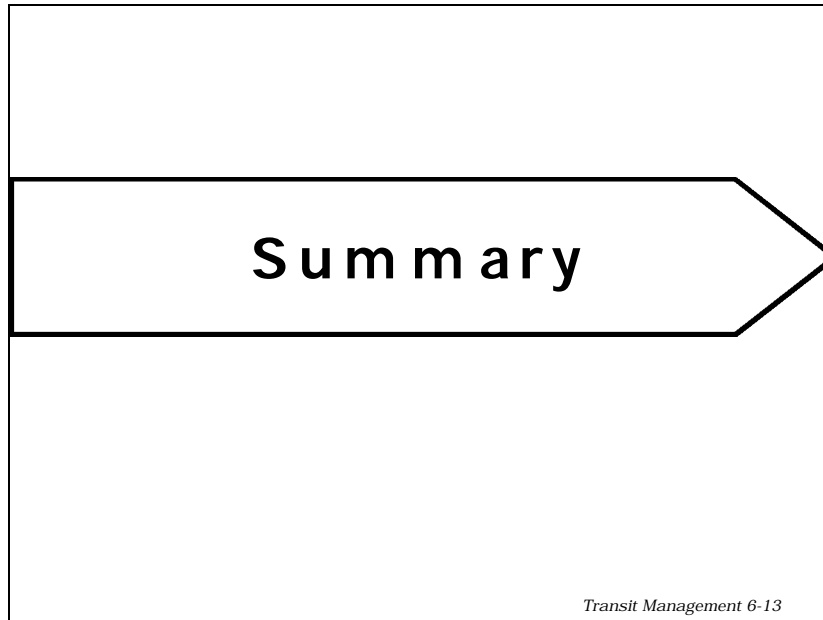
To advertise the SHUTTLE and to sign up customers, Pierce Transit uses their Internet site www.piercetransit.org/shuttle.htm. The site also has maps and a reservation and information system.

Continued on next page



Examples, Continued

Slide:
Summary



Transit Management Training Course		ITS Professional Capacity Building		NTI course
Title		Technical Seminars	Short Courses	
Module 6: Paratransit	<i>See also Module 5</i>			
	Comprehensive ADA Paratransit Eligibility Determinations			X
	Efficiencies in Paratransit Scheduling and Dispatching			X
	Managing and Planning Paratransit Operations			X



**TABLE 6-1: APTS PARATRANSIT APPLICATIONS
TECHNOLOGY REFERENCE**

<i>Technology</i>	<i>Description</i>	<i>Costs, Benefits, and Risks</i>
Scheduling and dispatching software	Computer software that aids in on-demand scheduling and dispatching	<ul style="list-style-type: none"> • Automates scheduling and dispatching activities, such as developing vehicle routes, matching clients to available vehicles, determining pick-up and drop-off locations • Generates reports and integrates with other agency functions • Creates multiple scheduling scenarios and solutions • Integrates easily with other ITS technologies for paratransit • Improves ADA compliance and passenger satisfaction • Many software vendors, but may have to do a lot of research before choosing one
Transit telecommunications	Typical applications include radio frequency (RF) and cellular digital packet data (CDPD) technology that carry signals from dispatch to vehicles, among others	<ul style="list-style-type: none"> • Assists in real-time scheduling and dispatching • Dispatch can communicate with and dynamically re-route their vehicles • Can be difficult to get radio frequencies due to high demand • CDPD technology very new and can be expensive
Geographic Information Systems (GIS)	Combination of maps and relational database to cross-reference transit information with maps	<ul style="list-style-type: none"> • Assists in real-time scheduling and dispatching • Helps operations planning and helps solve complex route problems • Can determine ADA route eligibility • Helps locate vehicles on street maps to assist in directions and to let clients know location of vehicles
AVL linkage	Automatic Vehicle Location devices that send signals to dispatch	<ul style="list-style-type: none"> • In real-time, can re-route and direct vehicles • Monitors position and status of vehicles and can pass on that information to customers • Risks are same as in Module 2: Automatic Vehicle Location Systems (interference, costs, monitoring off-route)
On-board mobile data terminals	Data terminals on board paratransit vehicles that transmit and receive instructions	<ul style="list-style-type: none"> • Allows real-time dispatching between paratransit center and vehicles • Can re-route and direct vehicles • Gathers information on trip length and number of passengers • Interacts with ID cards to obtain information on passenger eligibility and billing



Exercise 6-1: Custom Course Notes

In this exercise

You will:

- be able to describe the possible benefits of using paratransit CAD technologies in your transit systems
-

Directions

Read the success story provided below and answer the questions that follow.

**Success story:
A-Ride in
Ann Arbor**

Ann Arbor's paratransit service ("A-Ride"), as part of its advanced operating system deployment, has implemented computer-aided dispatch, automated scheduling, and advanced communications for its own five AVL-equipped specialized paratransit vehicles and three subcontracted vehicles. This integrated automated system is able to provide service 24 hours per day, seven days a week, with the services of a dispatcher needed only to take reservations from callers, confirm rides, receive cancellations, and intervene in special circumstances, such as "no shows." Eventually, an interactive voice response system is expected to reduce the number of calls dispatchers will have to handle in person.

Each of the eight paratransit vehicles has an 800 megahertz radio, onboard computer, and MDT. The system minimizes voice transmissions by providing data messages regarding vehicle status, operating condition, and location over a data channel. A voice channel is available when it is necessary for drivers and dispatchers to speak to each other.

The MDTs have graphical screens with menu options and preprogrammed keys to interact with the various onboard systems, including the radio. This allows the driver to select an appropriate time to read and respond to text messages sent from the dispatcher. The MDTs have various buttons for the driver to hit at key points of a pickup: an Arrive button when the driver arrives at a stop, a Perform button when a customer has successfully entered the vehicle via the lift, and a No Show button when the customer is not at the scheduled pickup point.

Continued on next page



Exercise 6-1: Custom Course Notes, Continued

Success story:
A-Ride in
Ann Arbor,
continued

The GPS-based AVL enables the system to perform dynamic scheduling: if a vehicle is running early or a customer does not show up at a stop, additional trips may be inserted into a vehicle's schedule and transmitted to the vehicle's MDT automatically; conversely, stops may be eliminated from a route if traffic conditions prevent the vehicle from arriving at its stops in a timely manner. Dispatchers add or remove trips, and the system automatically adjusts the schedules and transmits them to the driver. Schedules are sent to drivers 60 minutes in advance.

A-Ride serves about 550 clients per day. Trips on the eight specialized paratransit vehicles equipped with lifts are reserved for approximately 150 daily ADA clients that cannot travel any other way. AATA finds it more economical to use taxicabs for the remaining 400 clients who do not require lifts on vehicles.

Source: APTS State of the Art Update '98, p. 2-49 to 2-50

Question 1

Which technologies are used by A-Ride as described above?

Continued on next page



Exercise 6-1: Custom Course Notes, Continued

Question 2

List three benefits this technology of using ITS technologies in the paratransit applications in your region.

Continued on next page



Exercise 6-1: Custom Course Notes, Continued

For more information

For additional information, use the following table to look up additional examples of what is going on in the field.

Paratransit CAD Examples			
Technology	Story	Update '98	Additional info
Scheduling and dispatching software	SMART in Detroit, MI	p. 2-56	<i>Update '96</i> , p. 50
	Community Transit of Delaware County, Folsom, PA	p. 2-56	<i>Update '96</i> , p. 52
	OUTREACH, Santa Clara County, CA	p. 2-53	See example in SG p. 21. See also <i>Update '96</i> , p. 53.
Integration between agencies	Southern California Association of Governments (SCAG) Smart Shuttle, San Gabriel Valley, CA	p. 2-54	
AVL	METROLift, Houston, TX	p. 2-50	Trunked radio. See also <i>Update '96</i> , p. 55.
Autonomous dial-a-ride transit (ADART)	Corpus Christi Regional Transportation Authority, Corpus Christi, TX	p. 2-51	For a description of ADART, see p. 2-49, the last paragraph of the State-of-the-art summary in <i>Update '98</i> .
Internet	KITSAP transit agency at www.telebyte.com/kittrans		

